2

Alternatives

Changes in Chapter 2 Between Draft and Final EIS

Procedures for road closure and expected length of time that temporary roads would remain open have been clarified under FEIS Sections 2.1.2.2 and 2.1.3.2.

Additional survey management direction has been added in FEIS Table 2.1.7.

Requirement for soils scientist determination prior to burning has been added in FEIS Table 2.1.7

A specific mitigation measure has been added to unit 11 in FEIS Table 2.1.8.

CHAPTER 2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.01 Introduction

This chapter describes and compares the alternatives considered for the West Bear Vegetation Management Project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social and economic effects of implementing each alternative.

2.02 Alternative Development Process

Landscape Analysis

The West Bear project general analysis area encompasses 16,312 acres. In order to synthesize the various resource conditions, objectives, and opportunities, an interdisciplinary team (IDT) conducted a landscape analysis of the planning area. The landscape analysis identified logical "treatment" areas (silvicultural treatment accomplished through timber harvesting), and ranked these for consideration for timber harvest and environmental analysis. The proposed area was selected for timber harvest consideration because of the condition of the stands when compared to the Forest Plan desired future conditions, the presence of insect predation, and the fact that the area has easy access. The current and desired future conditions of the landscape, and applicable goals and objectives of the Revised Forest Plan (see discussion of Purpose and Need in Chapter 1), were factors in this selection. The West Fork Bear River Ecosystem Management Project documents the landscape analysis process and is part of the West Bear project planning record.

Proposed Action

Areas considered for management under the West Bear project were initially based on all of the forest lands within Management Prescription Categories (See Map 4 in Appendix A) that permit harvest under the Forest Plan (MPCs 4.4, 5.1, and 6.1 – totaling 12,297 acres). Potential units were then selected that reflect the best opportunities to develop stand conditions that would lead to development of properly functioning condition over the long term, and would approach the treatment acre needs identified in the West Fork Bear River Ecosystem Management Project. Additional early analysis of these units led to deferring or dropping several potential harvest units from further consideration at this time. When analyzed in more detail, some of these units were determined not to be harvestable without violating Forest Plan standards and guidelines, and some would require modifications to meet standards and guidelines that would make them uneconomical to harvest. Others were dropped because of concerns over potential impacts to fish and amphibians.

Based on short- and long-term landscape or resource objectives (see Chapter 1), the IDT assigned preliminary timber harvest prescriptions for each potential harvest unit. The roads needed to access the units were then evaluated in the field. These units were also used for public scoping for the project, and were identified at that time as the "proposed action." The proposed action for this EIS, as described in Chapter 1 and considered in detail as Alternative 2, has changed slightly from the one described during scoping as a result of field analysis.

Potential harvest units were validated, modified, dropped and/or deferred based on findings of field investigations. Modifications were made as needed to meet Forest Plan standards and guidelines. For instance, if a previously unknown stream was discovered (i.e., was not visible on aerial photos), the Riparian forest-wide standards and guidelines would be applied. Some units were adjusted to have more logical boundaries or to facilitate logging systems, and some expanded to prevent isolating timber stands from future harvest. This effort led to the current 38 units totalling 1,686 acres, from which the proposed action and all action alternatives were developed. Site-specific descriptions and resource considerations for each potential harvest unit are included in the Silvicultural Prescription.

Development of Alternatives

The IDT used information from public scoping, including the significant issues identified for the project (see Chapter 1), in conjunction with the field-verified pool of units and related resource information, to formulate different alternatives. The proposed action and each action alternative presented in this EIS provide a different response to the significant issues. For example, if a project issue concerned the high cost of timber harvest operations, then an alternative minimizing transportation costs by selecting units already accessed by roads might be developed. Each action alternative is also designed to meet the stated purpose and need for the West Bear project, and the project-specific desired future conditions.

Each action alternative represents a site-specific proposal developed through intensive interdisciplinary evaluation of timber harvest unit and road design, based on field verification. Unit identification and design also made use of high resolution topographic maps and aerial photos, and a large quantity of resource data available in geographic information system (GIS) format.

2.1 Alternatives Considered in Detail

The Forest Service developed three alternatives, including the No Action and Proposed Action alternatives, to meet Wasatch-Cache Forest Plan objectives and in response to issues raised by the public.

2.1.1 Alternative 1 - No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. No timber harvest, prescribed burning, road construction, or road relocation would be implemented to accomplish project goals. Previously authorized projects, roads and facility maintenance, and other "normal" Forest management activities would remain ongoing. Road management would be in accordance with the current Mountain View/Evanston District Travel Plan (USDA Forest Service 2003a).

This alternative would not preclude Forest management activities identified under previous decisions, nor would it preclude the potential for activities identified under future decisions.

2.1.2 Alternative 2 - The Proposed Action

The action proposed by the Forest Service to meet the purpose and need includes timber harvesting, prescribed burning, construction of temporary roads, intermittent service roads, and minor reconstruction of existing system roads. See Map 2 in Appendix A. Alternative 2 treats stands within the analysis area to begin developing properly functioning condition within the spruce/fir, mixed conifer and mixed aspen/conifer forest types. Timber harvest would consist of a variety of practices depending upon the specific forest type and stand condition. Treatment would involve group selection harvest in spruce/fir and mixed conifer stands, small (1 to 5 acre) patch cutting in mixed aspen/conifer stands, conifer removal and prescribed burning in aspen/conifer stands, and prescribed burning in aspen stands. The proposal includes retaining green trees and snags for wildlife habitat. Approximately 1,686 acres within 38 units would be treated under the proposal. Harvests would be accomplished using ground-based systems, and in conformance with Forest Plan Standards and Guidelines. Approximately 10,220 hundred cubic feet (CCF) would be harvested. Approximately 326 acres of aspen and mixed aspen/conifer would be burned following removal of conifers on those acres. In addition, 197 acres would be prescribed burned without prior conifer harvest. Access to the timber would require the construction of approximately 7.8 miles of temporary roads, 0.9 miles of intermittent service system roads, and relocation of approximately 0.6 miles of existing system roads to reduce sedimentation and improve drainage. All temporary roads would be recontoured / rehabilitated after harvest. Proposed reconstruction or relocation of existing roads would emphasize improving drainage design of the roads near stream crossings and relocating or improving drainage where the roads are near stream channels. No harvest or road construction would take place in inventoried roadless areas. Firelines would be constructed where needed prior to burning to reduce the probability of fire escaping the boundaries. Approximately 1.8 miles of firelines would be needed.

Table 2.1.1. Alternative 2 Vegetation Treatments

Project Name	Primary Forest Type	Acres Treated	Approximate Volume
Moffit Sale	Spruce/fir	575	5,580 CCF
	Aspen/Conifer	161	
Reservoir East Sale	Mixed Conifer	427	3,500 CCF
	Aspen/Conifer	41	
Mill City Sale and Burn	Aspen/Conifer	285	1,140 CCF
Mill City Burn	Aspen/Conifer	197	0
Total		**1,686**	**10,220 CCF**

2.1.2.1 Vegetation Management

Spruce/fir treatment would consist of the following:

1. Group Selection (patch cuts). Within the 575 gross acres of spruce/fir stands identified for treatment, harvesting would create approximately 115 acres of small openings to establish spruce regeneration. Openings would range from ¼ acre to ½ acre in size, and planting containerized spruce seedlings after harvest would ensure adequate spruce regeneration. Existing small openings would be used whenever possible to meet treatment objectives.
2. Thinning. This treatment would thin dense groups of mature spruce within approximately 460 acres of spruce/fir stands (575 acres minus 115 acres of group selection) to reduce the stand density. Thinning would be discontinuous concentrating on groups or "clumps" of trees. Clumps of large diameter spruce trees would be thinned to a residual basal area of approximately 120 square feet to reduce higher stand densities associated with "high hazard" ratings for spruce beetle (Schmid and Frye 1976). Thinning would remove both subalpine fir and spruce trees to perpetuate spruce on the landscape, while maintaining a mixed species stand to improve resistance to future spruce beetle activity. Standing and down trees would be retained to benefit wildlife in accordance with Forest Plan Guidelines.
3. Salvage. Harvest would remove existing insect killed and infested trees in excess of those needed to meet Forest Plan guidelines for snag and woody debris retention. Recently killed trees in the spruce/fir stands are generally individual trees or very small patches of trees The exact amount of trees or acres that would be treated vary in that each year additional trees are being killed through bug infestations in the analysis area.

Mixed Conifer stands contain substantial variation in species composition; therefore no single treatment would be applied uniformly throughout the stands. Rather the treatments would be determined by the composition of patches within the stand and would consist of the following:

1. Group Selection (patch cuts). Within the 427 gross acres of mixed conifer, an estimated 85 acres of groups and/or small patches would be harvested to increase the amount of mixed conifer regeneration within the type. Groups in patches of spruce/fir would not exceed ½ acre in size; groups in lodgepole pine dominated patches would be approximately 1 to 2 acres in size, unless a larger area is needed to address insect infestation.
2. Thinning. Thinning clumps of large spruce and/or lodgepole pine would reduce bark beetle hazard ratings on 342 acres (427 acres minus 85 acres of regeneration). Spruce clumps would be thinned to 120 square feet to reduce the higher densities associated with "high hazard" ratings for spruce beetle, while lodgepole pine clumps would be thinned to less than 100 square feet to reduce susceptibility to mountain pine beetle activity.
3. Salvage. Harvest would remove existing insect killed and infested trees in excess of those needed to meet Forest Plan guidelines for snag and woody debris retention. These are mountain pine beetle infested patches of lodgepole pine and are located primarily in unit 36. Most are less than 2 acres in size, although beetle activity is increasing and these patches may become larger. The exact amount of trees or acres that would be treated vary in that each year additional trees are being killed through bug infestations in the analysis area.

Aspen/Conifer treatment would consist of the following:

1. Harvest merchantable conifers from 5 stands totaling 326 acres. Slash would be left scattered to provide fuel for prescribed burning.
2. Prescribed burn harvested areas to stimulate aspen regeneration. The fire is expected to burn up to an additional 197 acres between harvested units. Assuming 80% burn effectiveness, 418 acres would be regenerated.

3. Small (1-5 acre) patch cuts totaling about 40 acres would be scattered within the 161 acres and would regenerate aspen within Units 7, 24 and 25.

2.1.2.2 Roads and Firelines

Road and fireline work associated with Alternative 2 is summarized in Table 2.1.2. Roads to be constructed include approximately 7.8 miles of temporary road, 0.9 miles of intermittent service road, relocating 0.6 miles of existing system road to improve drainage and reduce sedimentation, and applying spot surfacing (gravel) to segments of an existing system road (80032). The disturbed area for roads is generally 12 to 16 feet wide depending on curves and topography. The disturbed area for machine constructed firelines is generally about 10 feet wide.

Temporary roads would be constructed to minimal standards (level 1). These roads would be located to minimize their potential to impact water quality. As part of the initial road clearing, slash removed from the right-of-way would be placed in a windrow below the excavated soil so that it could be replaced on the recontoured surface following use. Following unit harvest, the road would be fully recontoured. Recontouring would include replacing soil back onto the road prism to return the ground to its natural contour, placing slash and woody debris on the disturbed area, and seeding the disturbed area. Following use, the road would appear as a linear opening. Within 10 to 15 years (depending on location), the area would become heavily brushed in or grown in with young trees. Temporary road construction and closure would be completed as a part of timber sale contracts and be financed by from funds generated by the sale. With the exception of the temporary roads into units 41, 42, 43, and 44 in the Mill City Sale and Unit 34 in Reservoir East Sale, closure would immediately follow completion of timber haul. This would normally be within 1 year following construction.

The temporary roads in the Mill City Sale and unit 34 would be located to serve as firelines during the prescribed burning phase of the project. Following the burn, they would be recontoured as described above. This would normally occur within one year following prescribed burning which could be up to two or three years following construction. Public access would be blocked during that time. Financing for recontouring would be provided by KV funds from the sale or appropriated dollars.

Intermittent service roads would be constructed to provide future access into units 2, 3, 5, 6, and 11. Intermittent service roads would remain as level 1 roads after harvest, with surface scarification and seeding to stabilize the road prism. Culverts and fill installed to cross the stream channels would be removed following closure of the intermittent service roads. They are spur roads from an existing gated intermittent service road and would not be open to public traffic.

Portions of Roads 80324, 80309 and 80135 (Whitney Area) would be relocated to improve drainage and reduce existing erosion problems. All of these road segments are poorly located in wet areas and are currently deeply rutted by recreational traffic. The new locations would shift the road to a better location that would permit maintenance of the surface and improve the drainage. In addition, spot surfacing would be applied to sections of road 80069 to improve the running surface, reduce erosion and facilitate maintenance. Road relocation and surfacing would be financed by the timber sale.

Table 2.1.2. Alternative 2 Roads and Firelines.

Sale Name	Unit #	Acres	Temp Rd (Mi.)	Int. Svc. Rd (Mi)	Road Reloc. (Mi)	Fireline (Mi)
Moffit Sale	2	19	0.2	0	0	0
	3	44	0	0.5	0	0
	5	18	0.1	0	0	0
	6	21	0.3	0.1	0	0
	7	28	0.1	0	0	0
	8	16	0.1	0	0	0
	9	13	0	0	0	0
	10	16	0	0	0	0
	11	169	0	0.3	0	0
	12	57	0.1	0	0	0

Sale Name	Unit #	Acres	Temp Rd (Mi.)	Int. Svc. Rd (Mi)	Road Reloc. (Mi)	Fireline (Mi)
	13	11	0.1	0	0	0
	14	8	0.1	0	0	0
	15	25	0.2	0	0.1	0
	16	8	0.1	0	0	0
	17	21	0.2	0	0	0
	18	22	0.5	0	0.3	0
	19	6	0	0	0	0
	20	42	0.3	0	0	0
	21	6	0	0	0	0
	22	10	0	0	0	0
	23	7	0	0	0	0
	24	80	0.7	0	0	0
	25	53	0.4	0	0	0
	26	14	0.2	0	0	0
	27	22	0	0	0.2	0
Moffit Total	**25**	**736**	**3.7**	**0.9**	**0.6**	**0**
Reservoir East Sale	30	47	0.2	0	0	0
	31	19	0	0	0	0
	32	65	0.1	0	0	0
	33	60	0.1	0	0	0
	34	41	0.4	0	0	0.2
	35	161	0.6	0	0	0
	36	56	0	0	0	0
	37	19	0	0	0	0
Reservoir East Total	**8**	**468**	**1.4**	**0**	**0**	**0.2**
Mill City Sale and Burn	41	43	0.5	0	0	0.3
	42	47	0.3	0	0	0.2
	43	75	1.0	0	0	0.1
	44	120	0.9	0	0	0.6
	Burn	197	0.0	0	0	0.0
Mill City Totals	**5**	**482**	**2.7**	**0**	**0**	**1.6**
Totals	**38**	**1,686**	**7.8**	**0.9**	**0.6**	**1.8**

Table 2.1.3. Summary of the activities that would be included in this alternative.

Alternative 2 - Activities	
Activity	**Quantity**
Acres Treated	1,686
Acres Harvested	1,489
Timber Harvest Volume	10,220 CCF
Prescribed Burning / aspen regeneration	523 / 418 acres*
Fireline Construction/Rehabilitation	1.8 miles
Temporary Road Construction/Obliteration	7.8 miles
Intermittent Service Road Construction	0.9 miles
System Road Relocation	0.6 miles

*Assumes 80% burn effectiveness.

2.1.3 Alternative 3

Alternative 3 responds to environmental concerns with the effects of road construction. See Map 3 in Appendix A. It provides an alternative that constructs no new system roads and reduces the amount of temporary road compared to Alternative 2. The alternative treats stands within the project area to begin developing properly functioning condition within the spruce/fir, mixed conifer and mixed aspen/conifer forest types. Timber harvest would consist of a variety of practices depending upon the specific forest type and stand condition. Alternative 3 would reduce road construction and emphasize prescribed fire without mechanical pretreatment. It would treat approximately 1,387 acres within 28 harvest units. It would require construction of approximately 1.9 miles of temporary roads, no intermittent service system road, and relocation of approximately 300 feet of an existing system road to reduce sedimentation and improve drainage. Temporary roads would be recontoured/rehabilitated after harvest as with the proposed action. An estimated 6.4 miles of firelines would be needed to accomplish the prescribed burning.

Conifers would not be harvested from Units 34 (Moffit Sale), 41 and 42 (Mill City Burn) prior to burning; the units would be burned without prior treatment other than fireline construction.

2.1.3.1 Vegetation Management

Table 2.1.4. Alternative 3 Vegetation Treatments

Project Name	Primary Forest Type	Acres Treated	Approximate Volume
Moffit Sale	Spruce/fir	389	3,859 CCF
	Aspen/Conifer	127	
Reservoir East Sale	Mixed Conifer	348	2,723 CCF
	Aspen Conifer (Burn Only)	41	
Mill City Burn	Aspen/Conifer (Burn Only)	482	0
Total		**1,387**	**6,582 CCF**

Spruce/fir treatment would consist of the following:

1. Group Selection (patch cuts). Within the 389 acres to be treated, approximately 78 acres of small openings would be created to establish spruce regeneration. Openings would not exceed ¼ to ½ acre in size, and planting containerized spruce seedlings after harvest would ensure adequate spruce regeneration. Existing small openings would be used whenever possible to meet treatment objectives.
2. Commercial Thinning. This treatment would thin dense clumps of spruce within the remaining 311 acres (389 total acres minus 78 acres of group selection) of spruce/fir stands to reduce the clump density, or its basal area. Clumps of large diameter spruce trees would be thinned to a residual basal area of approximately 120 square feet to reduce higher stand densities associated with "high hazard" ratings for spruce beetle (Schmid and Frye 1976). Thinning would remove both subalpine fir and spruce trees to perpetuate spruce on the landscape, while providing a mixed stand to improve resistance to future spruce beetle activity. Standing and down trees would be retained to benefit wildlife in accordance with Forest Plan Guidelines.
3. Salvage. Harvest would remove existing insect killed and infested trees in excess of those needed to meet Forest Plan guidelines for snag and woody debris retention. Recently killed trees in the spruce/fir stands are generally individual trees or very small patches of trees.

Mixed Conifer stands contain substantial variation in species composition; therefore no single treatment would be applied uniformly throughout the stands. Rather the treatments would be determined by the composition of patches within the stand and would consist of the following:

1. Group Selection. Within the 348 mixed conifer acres to be treated, an estimated 70 acres of groups and/or small patches would be harvested to increase the amount of mixed conifer regeneration within the type. Groups in patches of spruce/fir would not exceed ½ acre in size; groups in lodgepole pine dominated patches would be approximately 1 to 2 acres in size, unless a larger area is needed to address insect infestation.
2. Commercial Thinning. Thinning clumps of large spruce and/or lodgepole pine would reduce bark beetle hazard ratings within the remaining 314 acres. Spruce clumps would be thinned to 120 square feet to reduce the higher densities associated with "high hazard" ratings for spruce beetle, while lodgepole pine clumps would be thinned to less than 100 square feet to reduce susceptibility to mountain pine beetle activity.
3. Salvage. Harvest would remove existing insect killed and infested trees in excess of those needed to meet Forest Plan guidelines for snag and woody debris retention. These are mountain pine beetle infested patches of lodgepole pine and are located primarily in unit 36. Most are less than 2 acres in size, although beetle activity is increasing and these patches may become larger

Aspen/Conifer treatment would consist of the following:

1. Construct Firelines around burn units. No timber harvest would occur within the units.
2. Prescribed burn approximately 523 acres to stimulate aspen regeneration. Assuming 40% burn effectiveness, 209 acres would be regenerated.
3. Small (1-5 acre) patch cuts totaling about 32 acres would be scattered within the 127 acres and would regenerate aspen within Units 7, 24 and 25. (Moffit Sale).

2.1.3.2 Roads and Firelines

Table 2.1.5 summarizes road and fireline work associated with Alternative 3. Road construction includes approximately 1.8 miles of temporary road, relocating 0.1 miles of existing system road to improve drainage and reduce sedimentation, and applying spot surfacing (gravel) to segments of an existing system road (80032).

Temporary roads would be constructed to minimal standards. These roads would be located to minimize their potential to impact water quality. As part of the initial road clearing, slash removed from the right-of-way would be placed in a windrow below the excavated soil so that it could be replaced on the recontoured surface following use. Following unit harvest, the road would be fully recontoured by replacing soil back onto the road prism to return the ground to its natural contour, placing slash and woody debris on the disturbed area, and seeding the disturbed area. Following use, the road would appear as a linear opening. Within 10 to 15 years (depending on location), the area would become heavily brushed in or grown in with young trees. Temporary road construction and closure would be completed as a part of timber sale contracts and be financed by timber-generated revenue. Closure would immediately follow completion of timber haul. This would normally be within 1 year following construction.

A portion of Road 80324 (Whitney Area) would be relocated to improve drainage and reduce existing erosion problems. This road segment is poorly located in a wet area and is deeply rutted by recreational traffic. The new location would shift the road segment to a better location that would permit maintenance of the surface and improve the drainage would be financed by the timber sale. In addition, spot surfacing applied to sections of road 80069 would improve the running surface, reduce erosion and facilitate maintenance. Road relocation and surfacing would be financed by the timber sale. Any number of actions included under Alternative 2 could be selected for inclusion in Alternative 3.

Firelines would be constructed around the perimeter of Units 41 and 42 to facilitate burning. Following the treatment, the firelines would be recontoured, seeded and blocked to traffic by placing slash and rocks on the surface. The recontouring work would be financed by appropriated funds.

Table 2.1.5. Alternative 3 Roads and Firelines.

Project	Unit #	Acres	Temp Road (Mi)	Int. Svc. Road (Mi)	Road Reloc. (Mi)	Fireline (Mi)
Moffit Sale	7	28	0.1	0	0	0
	8	16	0.1	0	0	0
	9	13	0	0	0	0
	10	16	0	0	0	0
	11	149	0	0	0	0
	12	57	0.1	0	0	0
	13	11	0.1	0	0	0
	14	8	0.1	0	0	0
	15	25	0.2	0	0.1	0
	16	8	0.1	0	0	0
	17	21	0.2	0	0	0
	20	42	0.3	0	0	0
	21	6	0	0	0	0
	22	10	0	0	0	0
	23	7	0	0	0	0
	24	54	0.3	0	0	0
	25	45	0.2	0	0	0
Moffit Total	17	516	1.8	0	0.1	0
Reservoir East Sale	29	19	0.1	0	0	0
	30	43	0	0	0	0
	31	19	0	0	0	0
	32	28	0.1	0	0	0
	33	60	0.1	0	0	0
	34	41	0	0	0	1.0
	35	104	0	0	0	0
	36	56	0	0	0	0
	37	19	0	0	0	0
Res. East Total	9	389	0.1	0	0	1
Mill City Burn	41	65	0	0	0	1.6
	42	417	0	0	0	3.8
Mill City Total	2	482	0	0	0	5.4
Total	28	1,387	1.9	0	0.1	6.4

Table 2.1.6. Summary of the activities that would be included in this alternative.

Alternative 3 - Activities	
Activity	**Quantity**
Acres Treated	1,387
Acres Harvested	864
Timber Harvest	6,582 CCF
Prescribed Burning / aspen regeneration	523 / 209 acres
Fireline Construction/Rehabilitation	6.4 miles
Temporary Road Construction/Obliteration	1.9 miles
Intermittent Service Road Construction	0 miles
System Road Relocation	0.1 miles

*Assumes 40% burn effectiveness.

2.1.4 Management Direction Common to All Action Alternatives

The Forest Service also developed the following management direction and mitigation measures to be used as part of all action alternatives.

Table 2.1.7. Management Direction and Mitigation Measures

Management Direction and Mitigation Measure Description	Alternative
Soil, Water, Fisheries and Aquatic Resources	
Erosion control measures would be left in place for one growing season or until no evidence of pedestaling, rills, or surface soil movement was evident	Alt. 2, Alt. 3
Riparian Habitat Conservation Area (RHCA) Category 1 consists of fish bearing streams and the area on either side of the stream extending from the edges of the active stream channel to 300 feet slope distance (600 feet, including both sides of the stream channel). Category 2 and 3 RHCAs consist of permanently flowing non-fish bearing streams and ponds, lakes, reservoirs and wetlands greater than one acre and the area on either side of the stream or pond extending from the edges of the active stream channel or pond edge to 150 feet slope distance (300 feet, including both sides of the stream channel or pond). Category 4 RHCAs include features with high variability in size and site-specific characteristics including seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas. At a minimum the interim RHCAs must include, landslides and landslide-prone areas, 100 feet slope distance. No vegetation treatments will be conducted in any of these RHCAs to meet Forest Plan Guidelines G9 and G45.	Alt. 2, Alt. 3
Prescribed burning would be conducted in the fall when soils are damp.	Alt. 2, Alt. 3
Ground based activities would be restricted to dry or frozen ground conditions generally between June 15 and December 30. Operations outside of the specified conditions may only occur on a case-by-case basis following consultation with a qualified soils specialist.	Alt. 2, Alt. 3
Main tractor skid roads (those receiving 3 or more passes by skidding equipment) on Apco fine and Hoodle soils found within 207 and 491soil types should be no less than 100 feet apart, except where converging. This applies to units 2-6, 11-14, 20, 24-26, and 31-37 in compliance with Forest Plan Guideline G4.	Alt. 2, Alt. 3
As soon as possible following the completion of harvest operations, not to exceed one year, landings would be recontoured to the original surface contour, ripped, and grass seeded with an approved Wasatch-Cache native seed mix. Coarse woody debris would be spread on site to provide for long-term soil productivity.	Alt. 2, Alt. 3
Skid trails would be water barred with slash scattered on their surfaces prior to discontinuing operations each fall, and where appropriate, seeded in compliance with Forest Plan Standard S2.	Alt. 2, Alt. 3
Temporary containment pits or barriers would be installed around any fuel storage units located on the forest during timber harvest or road construction operations in compliance with Forest Plan Standard S2.	Alt. 2, Alt. 3
Road decommissioning of temporary roads would require recontouring to match the natural slope gradient followed by seeding with Wasatch-Cache approved native grass species and spreading coarse woody debris on site to provide for long-term soil productivity.	Alt. 2, Alt. 3
Closure of intermittent service roads would include surface scarification and seeding, removal of culverts, removal of fills over culverts, and recontouring of stream banks to meet Forest Plan Guideline G13.	Alt. 2
Erosion control measures would be inspected and maintained on a recurrent basis until the site was stabilized to ensure their effectiveness to meet Forest Plan Guideline G13. Additional inspections and maintenance would occur following high rainfall events and prior to fall and spring runoff to ensure their effectiveness.	Alt. 2, Alt. 3
If debris or slash were to enter a stream, it would be removed by hand immediately whenever there is a potential for blockage of the stream or crossing structure, or if the stream has the ability to	Alt. 2, Alt. 3

Management Direction and Mitigation Measure Description	Alternative
transport such material.	
On temporary roads, sediment-buffering devices would be installed below all fill slopes within 300 feet downhill distance of streams or drainage crossings in compliance with Forest Plan Standard S2 and Guideline G47.	Alt. 2, Alt. 3
Temporary roads except for those in units 34, 41, 42, 43, and 44 under Alternative 2 would be re-contoured, seeded, and cover added within one season of completion of use in compliance with Forest Plan Standard S2. Those roads kept open would be cross drained at the end of the operating season.	Alt. 2, Alt. 3
Cross drain spacing (dips, grade sags, or water bars) on temporary roads would be approximately 300 feet for road grades between 0 and 5 percent, and approximately 200 feet or less for steeper grades. In unit 24, all drainages would pass through cross drain culverts.	Alt. 2, Alt 3
As temporary roads are closed, all culverts would be removed. Where culverts are removed, fill at crossings would be recontoured to a stable slope angle approximating natural undisturbed stream banks adjacent to the site, and fills would be seeded with an approved Wasatch-Cache seed mix.	Alt. 2, Alt. 3
Temporary and intermittent service roads would avoid wetlands and cross RHCA's at best crossing sites with the least distance across to meet Forest Plan Guideline G12.	Alt. 2, Alt. 3
Standard timber sale contract clauses would be applied that address resource and residual timber protection by requiring directional felling, pre-approved skid trails and landings, and logs yarded with leading edge free of the ground. These provisions would be used to protect conifer and aspen seedlings and steep slopes during harvests.	Alt. 2, Alt. 3
Cultural Resources	
Previously recorded heritage resource sites within units shall be avoided and protected from logging impacts to meet Forest Plan Guideline G88.	Alt. 2, Alt. 3
Any artifact or structure located during reconnaissance or project implementation would be left undisturbed and reported to the Forest Archeologist immediately to meet Forest Plan Guideline G88.	Alt. 2, Alt. 3
Vegetation and Forest Resources	
Surveys for sensitive plant species have been completed. If any additional populations are located, the Forest Botanist will be notified, and mitigation will occur as necessary. This could include unit boundary adjustments to exclude populations, alternative harvest methods to minimize ground disturbance, buffers around populations, and adjustments in harvest to meet prescriptions for sensitive plant habitats to meet Forest Plan Guideline G23.	Alt. 2, Alt. 3
All equipment that would be used off road would be washed prior to moving into the project area. All equipment would be inspected and approved before operations would begin.	Alt. 2, Alt. 3
Wasatch-Cache Native Grass Seed Mixes would be used in all areas to be seeded (intermittent service roads, temporary roads, and log landings) except where it has been determined there is a high possibility that weeds may be more competitive to meet Forest Plan Guideline G22. Other Wasatch-Cache Grass Seed mixes may be used in these locations.	Alt. 2, Alt. 3
Post harvest monitoring and control of weeds with herbicides would be required on intermittent service roads, temporary roads, and log landings to meet Forest Plan Guideline G25.	Alt. 2, Alt. 3
Wildlife Resources	
The Wasatch-Cache National Forest Revised Plan Dead and Down Woody Debris guidelines would be followed to meet Forest Plan Guideline G16.	Alt. 2, Alt. 3
Timber harvest will not be allowed within active northern goshawk nest areas (approximately 30 acres) during the active nesting period in compliance with Forest Plan Standard S12.	Alt. 2, Alt. 3
Harvest operations in units within ½ mile of active nests will not be allowed during nesting or post-fledging if the wildlife biologist determines that it is necessary to prevent disruption of	Alt. 2, Alt. 3

Management Direction and Mitigation Measure Description	Alternative
nesting or post-fledging activities to meet Forest Plan Guideline G15. Topography and timber haul routes will be considered.	
Restrict harvest operations between December 31 and June 15 to minimize disturbance to wildlife.	Alt. 2, Alt. 3
Restrict prescribed burning to the fall season, after neotropical nesting is over and fuels cure.	Alt. 2, Alt. 3
Additional goshawk surveys will be conducted prior to timber sale activities. Mitigation, buffers and/or modification of units will be implemented if these surveys detect goshawk nesting activity. These surveys are in addition to the sensitive species surveys done for the Biological Evaluation.	Alt. 2, Alt. 3
In accordance with Forest Plan Guideline (G16), snag and woody debris habitat components at the stand level (where they are available distributed over each treated 10 acres) will be maintained at the minimum levels and characteristics described in Table 1.5.2 in Chapter 1. If the minimum number of snags is unavailable, green trees will be substituted. If the minimum size is unavailable, then the largest trees available on site will be retained.	Alt. 2, Alt. 3
Visual Resources	
The Forest Landscape Architect would be involved with the planning of all units to insure that visual quality would be maintained to meet Forest Plan Standards and Guidelines during implementation of this project.	Alt. 2, Alt. 3
Create natural appearing openings as seen from middleground and superior viewers' positions. Configuration of opening should be free form with undulated edges. Feather edges of vegetation to mimic native vegetation.	Alt. 2, Alt. 3
In log decking areas stack logs as close to the travelway access as is safely possible and rip, re-contour and seed the deck areas with native seed.	Alt. 2, Alt. 3
Follow the natural contour of the land where possible when constructing fireline. When it is not possible, scarify fireline and seed with native vegetation. Scarification should undulate and disturb areas outside of the fireline prism.	Alt. 2, Alt. 3
Where borrow material for road maintenance or relocation is needed, modify existing steep road cuts to remove the geometry of the landscape and re-vegetate.	Alt. 2, Alt. 3
When constructing new roads alignment should follow the natural contour of the land as much a possible. Cuts and fills should be rounded and contoured to the existing landscape to eliminate the geometry of the road in the landscape.	Alt. 2, Alt. 3
Recreation	
Increase Forest Service presence until evidence of temporary roads have been re-established with native vegetation.	Alt. 2, Alt. 3
When closing temporary roads use adequate logs, rocks to block access to recontoured road tracks.	Alt. 2, Alt. 3
Temporarily close locations for primitive car camping in where timber operations pose a threat to the health and safety of the public, especially in the area of units 12-16, 20-23 and 25, and inform public of closures.	Alt. 2, Alt. 3
Suspend operations during holidays and weekends to minimize overall impact on campers and other recreationists using the area.	Alt. 2, Alt. 3
Provide the public with information so that they can make a choice as to whether they would like to recreate in the analysis area over the period of timber operations.	Alt. 2, Alt. 3

2.1.5 Unit Specific Management Direction

Table 2.1.8. Unit Specific Mitigation Measures

Unit Number	Unit Specific Mitigation Measure
2	300’ buffer between unit boundary and Humpy Creek.
3	300’ buffer between unit boundary and Humpy Creek.
5	100’ buffer along intermittent streams on east and west of unit
6	150’ buffer along perennial stream on east side of unit
7	No additional mitigation required.
8	No additional mitigation required.
9	100’ buffer around ponds. Maintain 150’ buffer between unit and stream on the east side.
10	100’ buffer around ponds. Maintain 150’ buffer between unit and stream on the east side, and 300’ buffer between unit and Meadow Creek.
11	100’ buffer around ponds. Maintain 150’ buffer between unit and stream on the west side. Maintain a 50’ buffer around wet seeps in north end of the unit.
12	100’ buffer along intermittent stream to east of unit
13	100’ buffer along intermittent stream to west of unit
14	No additional mitigation required.
15	No additional mitigation required.
16	No additional mitigation required.
17	Designate leave trees in clusters on the south end of the unit in the vicinity of ponds to benefit boreal toads.
18	100’ buffer along intermittent stream to north of unit
19	100’ buffer along intermittent stream to north of unit
20	Maintain 300’ buffer between unit boundary and unnamed tributary to the north of the unit.
21	Maintain 300’ buffer between unit boundary and unnamed tributaries to the north and east of the unit.
22	Maintain 300’ buffer between unit boundary and unnamed tributaries to the north and east of the unit.
23	No additional mitigation required
24	100’ buffer along intermittent stream to south of unit
25	100’ buffer along intermittent stream to north of unit
26	300’ buffer between unit and Meadow Creek; 100’ buffer along intermittent stream on south side of unit.
27	Access to unit will require fish passable culvert installation. Maintain 100’ buffer between unit and intermittent stream north of unit.
29	No additional mitigation required.
30	Maintain 150’ buffer between unit boundary and Coyote Hollow Creek.
31	No additional mitigation required.
32	Maintain 100’ buffer between unit and intermittent stream east of unit.
33	No additional mitigation required.
34	No additional mitigation required.
35	No additional mitigation required.
36	No additional mitigation required.
37	No additional mitigation required.
41	No additional mitigation required.
42	Maintain 100’ buffer around pond.
43	No additional mitigation required.
44	No additional mitigation required.

2.1.6 Monitoring Requirements

Monitoring would be used to:

(1) Determine whether the original objectives of the activities were met.
(2) Determine the need for additional action.

(3) Educate and assist in designing future projects.

Implementation Monitoring: Would occur during contract preparation and on the ground implementation activities. Unit layout, marking, road closures, construction, drainage improvement, maintenance, and harvest operations would be monitored by Forest Service representatives to ensure compliance with West Bear EIS requirements.

Effectiveness Monitoring: Would be done during and following on the ground implementation activities. Monitoring would be done by Forest Service representatives to determine if the mitigation measures were effective.

Project Specific Monitoring

Because not all proposed activity areas could be monitored, representative areas would be identified for the proposed activities and sampled. The results of the data and interpretations from the sample sites would be extrapolated to similar areas and activity types. Most monitoring completed under this program would be ongoing for 4 to 5 years.

Implementation and effectiveness soil, water, and aquatics monitoring would be conducted in compliance with FSH 2509.18, 1/21/03 R4 Supplement, Soil Quality Monitoring, and FSH 2509.22, Soil and Water Conservation Practices. This monitoring would include soil samples on at least two units and monitoring of sediment movement from those units. Water quality monitoring will include observations of effectiveness of road realignment in reducing sedimentation of stream channels and effectiveness of best management practices at new stream crossings. Effectiveness of Riparian Habitat Conservation Areas (RHCA) will be monitored on at least two units adjacent to RHCAs.

Implementation monitoring would include documentation ensuring that timber sale preparation of all harvest units on the ground and in the contract are in compliance with the West Bear EIS requirements. It would also include documentation of timber sale administration site visits and observations of overall contract compliance. Post harvest effectiveness monitoring using regeneration surveys would be completed on all units to determine whether adequate regeneration has occurred and whether or not any additional planting is needed.

2.1.7 Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of this analysis, duplicative of the alternatives considered in detail, or determined to have components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

Alternative 4

This alternative was suggested during the scoping process. Alternative 4 would place the primary vegetation management emphasis on the use of prescribed fire and wildland fire use, limit harvest units to 1 acre in size and restrict harvesting to areas accessible from existing classified roads.

This alternative was not considered in detail because:

- Wildland fire use is not an acceptable practice within the analysis area (USDA FS 2005b) because of private land adjacent to the north side of the analysis area, the Bear River Lodge and Manor Lands and Uinta Lands subdivisions about 5 miles north east of the analysis area, and the infeasibility of safely burning much of the dense conifer forest types in the area without the risk of escaped fire.
- Alt 3 already presents a reduced road access and use of prescribed fire only on units that are feasible to safely burn.
- Limiting harvest to 1 acre patch size does not provide the flexibility to meet the purpose and need to recreate naturally occurring and varying patch sizes on the landscape.

Alternative 5

This alternative is similar to Alternative 4, but differs in that it does not allow timber harvest, relying on prescribed fire and wildland fire use to achieve desired future condition. As stated above, wildland fire use is not an acceptable practice within the analysis area because of the proximity of private lands to the north and northeast (downwind from the analysis area) and the infeasibility of safely burning much of the area within the West Bear analysis area.

Alternative 6

This alternative would preserve undeveloped landscapes within the West Bear area. It was not considered because Alternative 1 (No Action) would meet this objective. Alternative 3 substantially reduces effects on undeveloped areas by eliminating new specified road construction and allowing only limited temporary roads to provide access for timber harvest. Both action alternatives preserve corridors and have no effects on inventoried roadless areas.

2.2 Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2.2.1. Comparison of Alternatives.

Issue	Resource Values Analyzed		Effects of Alternatives		
			Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
Water Resources	Water yield increase in Acre-Feet / % (3.1.3.5, 3.1.4.3)	West Fk Bear	0	164 acre feet / .5 %	149 acre feet / .4 %
		West Fk Bear Above Whitney	0	12.9 acre feet / .2%	9.5 acre feet / .2 %
		Hayden Fork	0	39 acre feet / .1 %	39 acre feet / .1 %
	Timing of increased runoff (3.1.4.3)		No change	No change	No change
	Increase in peak flow (3.1.4.3)		No change	Slight increase	Slight increase
	Water Quality (3.1.4.2, 3.2.4)		No change	Very slight effect	Very slight effect
	Wetlands (3.1.4.1)		No change	Slight improvement from road relocation	No effect
	Floodplains (3.1.4.1)		No change	No effect	No effect
Soils	Wepp modeled erosion (3.2.4, 3.2.4.1)		No change	Very low	Very low
	Soil compaction (3.2.4.1)		No change	~13% of each activity area (harvest unit)	~13% of each activity area (harvest unit)
	Burning - hydrophobic soils (3.2.4.2)		No change	No effect	No effect
	Productivity (3.2.4.1)		No change	At least 85%	At least 85%
Aquatic Habitat	Riparian Habitat Conservation Areas (3.3.4.1)		No change	Slight increase in impacts	Slight increase in impacts
Threatened, Endangered and Sensitive Aquatic Species	Bonneville cutthroat trout (3.3.4.3)		No change	"May impact individuals, but is not likely to cause a trend toward Federal listing or a loss of viability"	"May impact individuals, but is not likely to cause a trend toward Federal listing or a loss of viability"
	Amphibians (3.3.4.4)		No change	Minor favorable and adverse effects	Minor favorable and adverse effects
Aquatic	Forest-wide trend in population		No change	No effect	No effect

Issue	Resource Values Analyzed		Effects of Alternatives		
			Alternative 1 (No Action)	**Alternative 2 (Proposed Action)**	**Alternative 3**
Management Indicator Species	of Bonneville cutthroat trout. (3.3.4.5)				
Properly Functioning Condition	Age Class Diversity and Species Composition. (3.4.4.1)		Continued gradual move away from PFC (Gradual loss of aspen and continued shortage of young age classes)	Improvement in conifer and aspen Age class diversity	Improvement in conifer and aspen age class diversity
	Fragmentation, biological diversity, and ecological integrity. (3.3.4, 3.4.4, 3.6.4)		No change in fragmentation. Continued trend toward mature and old forest habitat and potential for large stand replacing fires	Slight increase in fragmentation. Slight improvement in diversity of habitat. Ecological integrity maintained	Slight increase in fragmentation. Slight improvement in diversity of habitat. Ecological integrity maintained
	Disease and insect infestations (3.4.4.2)		Continued gradually increasing risk of landscape bark beetle epidemics	Age and species diversity and lower conifer density leading to future stand conditions that would be less likely to support beetle epidemics	Age and species diversity and lower conifer density leading to future stand conditions that would be less likely to support beetle epidemics
	Acres and percentage of forest type in fire regime condition classes. (3.5.4.1)		Gradual trend toward substantially altered fire regimes.	Slight improvement in watershed fire regime condition class	Slight improvement in watershed fire regime condition class
	Prescribed fire effects with and without fuel from conifer tops and limbs. (3.4.4.1)		No change	418 acres of conifer/aspen moved to seral aspen based on 80% burn effectiveness.	209 acres of conifer/aspen moved to seral aspen based on 40% burn effectiveness
Old Forest	Acres (%) of old forest in the ecosection. (3.4.4.4)	Spruce/Fir	No change, 83,319acres (67%)	Change in old forest structure on 575 acres	Change in old forest structure on 389 acres
		Mixed Conifer	No change, 60,169 Acres (43%)	Change in structure on 427 acres	Change in structure on 348 acres
	Acres of old forest in the analysis area. (3.4.4.4)	Spruce/Fir	No change	Change in old forest structure on 575 acres	Change in old forest structure on 389 Acres
		Mixed Conifer	No change	Change in structure on 427 acres	Change in structure on 348 acres
Noxious Weeds	Effects on noxious weeds. (3.4.4.3)		No change	Increased risk mitigated by equipment washing and follow-up treatment	Slightly less risk than Alt 2 mitigated by equipment washing and follow-up treatment
Sensitive	Effects on sensitive plants.		No change	No effect, one identified	No effect, one identified

Issue	Resource Values Analyzed		Effects of Alternatives		
			Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
Plants	(3.4.4.5)			site protected.	site protected.
Wildlife	Changes in forest habitat from timber harvest and prescribed burning. (3.6.4)		No change	Temporary increase in spruce/fir and mixed conifer forest gaps and large openings in conifer/ aspen forest	Same as Alt 2 with fewer spruce/fir and mixed conifer acres treated
	Effects of roads on noise, barriers to movement, fragmentation. (3.6.4)		No change	Increased traffic and equipment noise, Slight increase in snow compaction, temporary barriers to movement of some species.	Same as Alt 2 with proportionately less effect due to less road mileage.
	Effects of harvest and roads on migratory birds. (3.6.4.5)		Continued decline in forest habitat age and species diversity	Generally positive effects on aspen dependent and habitat generalists with minor adverse effects on old forest dependent species.	Same as Alt 2 with fewer effects on old forest dependent species.
Threatened, Endangered and Sensitive Terrestrial Species	Effects on Threatened, Endangered and Sensitive Terrestrial Species and their denning, nesting, and foraging habitat. (3.6.4.1)	Bald eagle	No change	"No effect"	"No effect"
		Canada lynx	No change	"May affect, but is not likely to adversely affect"	"May affect, but is not likely to adversely affect"
		Wolverine, boreal owl, great gray owl, three-toed woodpecker northern goshawk	No change	"May impact individuals, but is not likely to cause a trend toward Federal listing or a loss of viability"	"May impact individuals, but is not likely to cause a trend toward Federal listing or a loss of viability"
Terrestrial Management Indicator Species	Terrestrial Management Indicator Species and their denning, nesting, and foraging habitat. (3.6.4.4)	Snowshoe hare	No change	Slight short-term reduction in habitat and hares, increase after 10-15 years	Same as Alt 2 with fewer acres treated
		Beaver	No change	Minor favorable effect in Mill City area	Minor favorable effect in Mill City area
		Northern goshawk	Gradual long-term decline in nesting and foraging habitat associated with mixed conifer and aspen and early successional stands	Short-term reduction in suitable nesting habitat and foraging opportunities, long-term maintenance of conifer/aspen habitat	Same as Alt 2 except that fewer acres would be treated
	Forest-wide trend of Terrestrial	Snowshoe hare	No change	No significant effect on forest-wide trend	No significant effect on forest-wide trend

Issue	Resource Values Analyzed		Effects of Alternatives		
			Alternative 1 (No Action)	**Alternative 2 (Proposed Action)**	**Alternative 3**
	Management Indicator Species (3.6.4.4)	Beaver	No change	No significant effect on forest-wide trend	No significant effect on forest-wide trend
		Northern goshawk	No direct effects	No significant effect on forest-wide trend	No significant effect on forest-wide trend
Browsing / Aspen	Browsing impacts on past aspen treatment. (3.6.4.7)		No change	Possible minor effect on rapidity of aspen establishment	Possible minor effect on rapidity of aspen establishment
Recreational Use	Dispersed camp sites. (3.7, 3.8)		No change	Meets Forest Plan scenic integrity objectives, minimal direct effects on areas adjacent to 94 sites	Same as Alt 2
	Noise from timber harvest operations. (3.8.4.4)		No change	Adverse weekday effects on up to 109 campers at one time while harvest or haul operations are ongoing within ½ mile of camp sites	Same as Alt 2
	Effects of truck traffic on recreational traffic. (3.8.4.4)		No change	Estimated 4 loads per weekday with up to 9 loads per day using Whitney Road for 308 days	Estimated 4 loads per weekday with up to 9 loads per day using Whitney Road for 221 days
	Effects of road relocation on recreational use. (3.7, 3.8)		No change	Slightly improved access to some sites, removes shoreline road on Beaver Lake	Slightly improved access to some sites.
	Effects of harvest operations on snowmobiling. (3.8.4.1)		No change	Minor effect on opportunities before December 15	Same as Alt 2
Economic Efficiency	Economic efficiency comparison of alternatives. (3.9.4)		0	Benefits: $1,096,200 Costs: $644,100 PNV: $452,000	Benefits: $694,600 Costs: $438,300 PNV: $256,000
Timber Utilization	Anticipated timber sale size. (3.9.4)		0	1,489 acres, 10,220 Hundred Cubic Feet (CCF)	864 acres, 6,582 Hundred Cubic Feet (CCF)
	Anticipated timber sale scheduling. (2.1, 3.8, 3.9)		None	Moffit: 5,580 CCF Reservoir: 3,500 CCF Mill City: 1,140 CCF	Moffit: 3,859 CCF Reservoir E: 2,723 CCF
	Anticipated size categories of timber to be offered. (2.1)		None	Moffit: Sawlogs Reservoir E: Sawlogs Mill City: Sawlogs and poles.	Moffit: Sawlogs Reservoir E: Sawlogs Mill City: None
	Volume of merchantable timber burned (3.9.4)		None	Up to 100 CCF	Up to 1,200 CCF